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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/615,926	07/10/2003	Hideaki Yamasaki	010986.52578US	9914

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EXAMINER
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LUND, JEFFRIE ROBERT

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 09/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

8

# Office Action Summary

Application No.

10/615,926

Applicant(s)

YAMASAKI ET AL.

Examiner

Jeffrie R. Lund

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 28 June 2006 and 23 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 30-51 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 30-51 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 8/2006.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments, see page 8, filed June 28, 2006, with respect to the rejections of claims 30-51 under Shinriki et al, US Patent Application Number 2003/0236001 A1, have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, new grounds of rejection are made in view of JP 47-10730 and Tomita et al, JP 07-188932.

### ***Claim Objections***

2. Claim 47 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 1 requires "a gas analyzer analyzing a concentration of said source gas flowing through said source gas line in a part thereof located between said node and said reaction vessel". Claim 47 also requires that the gas analyzer measures said concentrations of said source gas in said source gas line at a downstream side of said node. Thus claim 47 does not further limit claim 1.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 48 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant

regards as the invention.

Claim 48 requires that the “gas analyzer measures said concentration of said source gas in said source gas line at an upstream side of said node”. Claim 1 requires “a gas analyzer analyzing a concentration of said source gas flowing through said source gas line in a part thereof located between said node and said reaction vessel”. It is not clear how the gas analyzer can sample the source gas line upstream of the node while it is sampling the supply gas line downstream of the node. The sample can be taken from the upstream side of the node or the downstream side of the node, not both at the same time.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 30-34, 36, 40, 41, 47, and 51 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 47-10730 ('730).

'730 teaches a CVD apparatus that includes: a reaction chamber 1 evacuated by an evacuating system and supporting a substrate 22 on a support 21; a source bottle 26 containing a liquid source material and forming a source gas therein as a result of vaporizing caused by a vaporizing gas (Ar) supplied via MFC 24 and vaporizing gas source line; a source gas supply line supplying said source gas to said reaction vessel 1; a diluting inert gas supplied via MFC 23 and connected to the source gas supply line

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at a node; a gas analyzer 27 provided in the source supply line; and a controller 31 controlling the MFC 23, 24, which control the flow rate of the gases as a result of the measurement of the concentration detector 31. (Figure 2) The specific gas is an intended use of the apparatus, and the apparatus of '730 can inherently supply the desired gas.

7. Claims 30-34, 38-41, 47, 49, 51, and 52 are rejected under 35 U.S.C. 102(b) as being anticipated by Tomita et al, JP 2001-214270.

Tomita et al teaches a CVD apparatus that includes: a reaction chamber 1 evacuated by an evacuating system 3 and supporting a substrate 6 on a support 7; a source bottle 16-19 containing a liquid source material and forming a source gas therein as a result of vaporizing caused by a vaporizing gas (Ar) supplied via MFC 33-36 and vaporizing gas source line; a source gas supply line supplying said source gas to said reaction vessel 1; a diluting inert gas supplied via MFC 37 and connected to the source gas supply line at a node; a gas analyzer 46 provided in the source supply line; a bypass gas line 9 connected to the gas analyzer; and a controller 31 controlling the MFC 23, 24, which control the flow rate of the gases as a result of the measurement of the concentration detector 31. (Figure, paragraph 20+) The specific gas is an intended use of the apparatus, and the apparatus of Tomita et al can inherently supply the desired gas.

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 35, 38, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 47-10730 ('730) in view of McMenamin, US Patent 4,436,674.

'730 was discussed above.

'730 differs from the present invention in that '730 does not teach that the diluting gas line is a bypass line bypassing the source bottle and including a variable valve, a bypass line connected to the source gas line and the evacuation system including the gas analyzer.

McMenamin teaches a gas supply system that includes a vaporizing line 20, a mass flow controller 24, 26 controlling the vaporizing gas, and a bypass line bypassing the source bottle and includes a variable control valve 32 and connected to the source gas line; and a bypass line 142 connected to the source gas line 140 and the evacuation system 320 via line 210. (Figure 1)

The motivation for adding the bypass line of McMenamin to the apparatus of '730 is to enable the apparatus of '730 to supply the vaporizing gas and the diluting gas from a common source, and to simplify the gas supply system.

The motivation for adding the bypass line connected to the source gas supply line and the evacuation system of McMenamin to the apparatus of '730 is to allow the source gas to be dumped to maintain a constant flow of the source gas when the apparatus is not in use, and to enable the supply lines to be evacuated.

The motivation for moving the gas analyzer of '730 from the source gas supply line to the bypass line is to provide an alternate and equivalent location for the gas analyzer. Furthermore, it has been held that the rearrangement of parts is obvious. (See *In re Japikse* 86 USPQ 70)

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the bypass lines of McMenamin to the apparatus of '730, and to move the gas analyzer of '730 to the bypass line connected to the exhaust system.

11. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 47-10730 ('730), in view of Ueda et al, US Patent 5,365,772.

'730 was discussed above.

'730 differs from the present invention in that '730 does not teach that the gas analyzer is located parallel to the source gas supply line and isolated by two valves.

Ueda et al teaches a gas analyzer 39 located parallel to a gas line 32 (from which the sample is taken) and isolated by valves 37 and 41. (Figure 3)

The motivation for moving the gas analyzer of '730 from the source gas supply line to a line parallel to the source gas supply line is to provide an alternate and equivalent location for the gas analyzer as taught by Ueda et al. Furthermore, it has been held that the rearrangement of parts is obvious. (See *In re Japikse* 86 USPQ 70)

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to move the gas analyzer of '730 to a position parallel to the source gas supply line and isolate the gas analyzer with valves as taught by Ueda et al.

12. Claims 42 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 47-10730 ('730) in view of Satake et al, JP 2001-234348.

'730 was discussed above.

'730 differs from the present invention in that '730 does not teach that the concentration detector is a FTIR.

Satake et al teaches a coating chamber that includes a FTIR concentration detector 20. (Abstract, figure 7)

The motivation for using a FTIR concentration detector in the apparatus of '730 is to provide a specific concentration detector as required but only generically disclosed by Satake et al.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the FTIR concentration detector of Satake et al in the apparatus of '730.

13. Claims 49 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 47-10730 ('730), in view of Holst et al, US Patent Application Publication



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2003/0056723 A1.

'730 was discussed above.

'730 differs from the present invention in that '730 does not teach that the concentration detector is a non-dispersion infrared spectrometer (NDIR).

Holst et al teaches using a NDIR concentration detector 20 to detect a concentration of material in a gas flow. (Paragraph 55)

The motivation for using a NDIR concentration detector in the apparatus of '730 is to provide a specific concentration detector as required but only generically disclosed by Holst et al.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the NDIR concentration detector of Holst et al in the apparatus of '730.

14. Claim 43-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 47-10730 ('730), in view of Tokai et al, US Patent Application Publication 2002/0014700 A1.

'730 was discussed above.

'730 differs from the present invention in that '730 does not teach that the controller receives input from a manometer (pressure sensor) and corrects the measured concentration based on the pressure.

Tokai et al teaches a coating chamber that includes a controller 38 that controls the gas sources 14 based on input from concentration detectors 36, 37 and a pressure sensor 60.

The motivation for controlling the concentration of the source gas in the apparatus of '730 using signals from both the concentration detector and pressure sensor as taught by Tokai et al is to control the source flows based on their concentrations, adjusted for the pressure.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to control the gas sources of '730 using information supplied by the concentration detector and pressure sensor as taught by Tokai et al.

15. Claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 47-10730 ('730) in view of O'Neill et al, JP 07-188932.

'730 was discussed above.

'730 differs from the present invention in that '730 does not teach that the gas analyzer is located upstream of the node.

O'Neill et al teaches a processing apparatus that includes a gas analyzer 46 located upstream of the node.

The motivation for moving the gas analyzer of '730 to a position upstream of the node as taught by O'Neill et al is to monitor the source gas without the inert gas, or to provide an alternate and equivalent location for the gas analyzer. Furthermore, it has been held that the rearrangement of parts is obvious. (See In re Japikse 86 USPQ 70)

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to move the gas analyzer of '730 as taught by O'Neill et al.

16. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita et al, JP 2001-214270 in view of McMenamin, US Patent 4,436,674.

Tomita et al was discussed above.

Tomita et al differs from the present invention in that Tomita et al does not teach that the diluting gas line is a bypass line bypassing the source bottle and including a variable valve, a bypass line connected to the source gas line and the evacuation system including the gas analyzer.

McMenamin teaches a gas supply system that includes a vaporizing line 20, a mass flow controller 24, 26 controlling the vaporizing gas, and a bypass line bypassing the source bottle and includes a variable control valve 32 and connected to the source gas line; and a bypass line 142 connected to the source gas line 140 and the evacuation system 320 via line 210. (Figure 1)

The motivation for adding the bypass line of McMenamin to the apparatus of Tomita et al is to enable the apparatus of Tomita et al to supply the vaporizing gas and the diluting gas from a common source, and to simplify the gas supply system.

The motivation for adding the bypass line connected to the source gas supply line and the evacuation system of McMenamin to the apparatus of Tomita et al is to allow the source gas to be dumped to maintain a constant flow of the source gas when the apparatus is not in use, and to enable the supply lines to be evacuated.

The motivation for moving the gas analyzer of Tomita et al from the source gas supply line to the bypass line is to provide an alternate and equivalent location for the gas analyzer. Furthermore, it has been held that the rearrangement of parts is obvious. (See *In re Japikse* 86 USPQ 70)

Therefore it would have been obvious to one of ordinary skill in the art at the time

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the invention was made to add the bypass lines of McMenamin to the apparatus of Tomita et al, and to move the gas analyzer of Tomita et al to the bypass line connected to the exhaust system.

17. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita et al, JP 2001-214270, in view of Ueda et al, US Patent 5,365,772.

Tomita et al was discussed above.

Tomita et al differs from the present invention in that Tomita et al does not teach that the gas analyzer is located parallel to the source gas supply line and isolated by two valves.

Ueda et al teaches a gas analyzer 39 located parallel to a gas line 32 (from which the sample is taken) and isolated by valves 37 and 41. (Figure 3)

The motivation for moving the gas analyzer of Tomita et al from the source gas supply line to a line parallel to the source gas supply line is to provide an alternate and equivalent location for the gas analyzer as taught by Ueda et al. Furthermore, it has been held that the rearrangement of parts is obvious. (See In re Japikse 86 USPQ 70)

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to move the gas analyzer of Tomita et al to a position parallel to the source gas supply line and isolate the gas analyzer with valves as taught by Ueda et al.

18. Claims 42 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita et al, JP 2001-214270, in view of Satake et al, JP 2001-234348.

Tomita et al was discussed above.

Tomita et al differs from the present invention in that Tomita et al does not teach that the concentration detector is a FTIR.

Satake et al teaches a coating chamber that includes a FTIR concentration detector 20. (Abstract, figure 7)

The motivation for using a FTIR concentration detector in the apparatus of Tomita et al is to provide a specific concentration detector as required but only generically disclosed by Satake et al.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the FTIR concentration detector of Satake et al in the apparatus of Tomita et al.

19. Claims 49 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita et al, JP 2001-214270, in view of Holst et al, US Patent Application Publication 2003/0056723 A1.

Tomita et al was discussed above.

Tomita et al differs from the present invention in that Tomita et al does not teach that the concentration detector is a non-dispersion infrared spectrometer (NDIR).

Holst et al teaches using a NDIR concentration detector 20 to detect a concentration of material in a gas flow. (Paragraph 55)

The motivation for using a NDIR concentration detector in the apparatus of Tomita et al is to provide a specific concentration detector as required but only generically disclosed by Holst et al.

Therefore it would have been obvious to one of ordinary skill in the art at the time

the invention was made to use the NDIR concentration detector of Holst et al in the apparatus of Tomita et al.

20. Claim 43-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita et al, JP 2001-214270, in view of Tokai et al, US Patent Application Publication 2002/0014700 A1.

Tomita et al was discussed above.

Tomita et al differs from the present invention in that Tomita et al does not teach that the controller receives input from a manometer (pressure sensor) and corrects the measured concentration based on the pressure.

Tokai et al teaches a coating chamber that includes a controller 38 that controls the gas sources 14 based on input from concentration detectors 36, 37 and a pressure sensor 60.

The motivation for controlling the concentration of the source gas in the apparatus of Tomita et al using signals from both the concentration detector and pressure sensor as taught by Tokai et al is to control the source flows based on their concentrations, adjusted for the pressure.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to control the gas sources of Tomita et al using information supplied by the concentration detector and pressure sensor as taught by Tokai et al.

21. Claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita et al, JP 2001-214270, in view of O'Neill et al, JP 07-188932.

Tomita was discussed above.

Tomita differs from the present invention in that Tomita does not teach that the gas analyzer is located upstream of the node.

O'Neill et al teaches a processing apparatus that includes a gas analyzer 46 located upstream of the node.

The motivation for moving the gas analyzer of Tomita to a position upstream of the node as taught by O'Neill et al is to monitor the source gas without the inert gas, or to provide an alternate and equivalent location for the gas analyzer. Furthermore, it has been held that the rearrangement of parts is obvious. (See In re Japikse 86 USPQ 70)

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to move the gas analyzer of Tomita as taught by O'Neill et al.

### ***Conclusion***

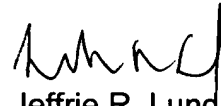
22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrie R. Lund whose telephone number is (571) 272-1437. The examiner can normally be reached on Monday-Thursday (6:30 am-6:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jeffrie R. Lund  
Primary Examiner  
Art Unit 1763

JRL  
3/20/06